

^{A1}
~~Conda~~ prepolymer.

^{A2} ⁷¹ ~~73~~. (Amended) The radiation curable resin composition of claim ⁷⁰ ~~72~~, wherein the filler is an organic filler, inorganic filler or blends thereof.

Please add new claim 74, as follows:

^{A3} ⁷² ~~74~~. (New) The radiation curable resin composition of claim ⁷¹ ~~73~~, wherein the filler comprises at least one of a Ni coated carbon powder, an iron powder, titanium dioxide, carbon black or thiokol blue.

REMARKS

The Applicants appreciate the Examiner's thorough examination of the subject application and the indication that claims 8-19 and 40 would be allowable if rewritten in independent form. Applicants request reconsideration of the subject application based on the following amendments and remarks.

Claims 19 and 73 have been amended and claims 14 and 43 have been cancelled without prejudice or disclaimer of Applicants' right to pursue the subject matter of the cancelled claims in this or a subsequent application. New claim 74 has been added. Support for the amendment to the claims may be found throughout the specification. No new matter has been added by the amendments to the specification or the claims.

Claim 14, 43, and 73 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is respectfully traversed.

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Although Applicants respectfully disagree with the position taken by the Examiner, the cancellation of claims 14 and 43 in the instant amendment obviate the rejection.

Although applicants respectfully disagree with the examiner, claim 73 has been amended and new claim 74 has been introduced. Applicant's believe that claims 73 and 74 teach the same subject matter as original claim 73.

It is respectfully submitted that these §112, second paragraph, rejections should be withdrawn.

Claim 19 has been objected to because the acronym HMDI was not spelled out clearly. Applicants believe that the amendment to claim 19 obviates this rejection. Support for the amendment may be found in Figure 3 and the brief description of Figure 3 in the specification which clearly show that HMDI is hexamethylene diisocyanate.

Claims 1-7, 20-21, 24-36, 41-42, 45-46, 54, 56-58, and 67-73 stand rejected under 35 U.S.C. §102(b) as being anticipated by Kovar (U.S. Patent 5,977,269).

Claims 1-7, 20-39, 41-54, and 56-73 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kovar (U.S. Patent 5,977,269).

For the sake of brevity, the two § 102 and § 103 rejections are addressed in combination. Such a combined response is considered appropriate because *inter alia* each of the rejections relies on the Kovar '269 patent as the sole or primary citation. Each of the rejections is traversed.

In formulating the §102(b) rejection, the Action states at page 4 that:

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Kovar et al teaches polyester, vinyl dioxolane based coating compositions that are VOC free and sprayable onto substrates and cured. Said composition comprises (a) at least one prepolymer that is the reaction product of (I) at least one substituted vinyl diololane of formula I and (ii) at least one ester of a polycarboxylic acid; and (b) a catalyst system to initiate the prepolymer reaction of (a). Said catalyst system comprises a cobalt/aluminum/zinc system. Said composition further comprises peroxide and a solubility enhancer. Said peroxide is known to initiate in thermal and ionizing radiation.

It is respectfully submitted that these rejection should be withdrawn.

The present invention is directed to radiation curable resin compositions, which contain essentially no volatile organic components, and which comprise at least one vinyl dioxolane end-capped oligomer, and at least one photoinitiator to initiate radiation cure of the oligomer. The coatings of the present invention are not disclosed or suggested by Kovar '269.

Applicants submit that the presence of a photoinitiator in the coating compositions of the instant invention, such as those photoinitiators provided by the specification at page 9, lines 15-30 and at page 22, lines 8-34, permit rapid curing of the coating composition by exposure to a radiation source such as visible or UV light sources.

The present invention further contemplates coating systems comprising both a radiation initiated catalyst and a thermally initiated catalysts. Applicants disclose the use of radiation and thermal cure catalysts as a means of facilitating the cure of thick coating layers and further suggest that the radiation initiated catalyst provides the heat necessary to initiate the thermal initiated catalyst. See, for example, page 11, lines 15-30. Addition of a thermally initiated catalyst system such as catalysts systems of cobalt and peroxide facilitate complete cure of the

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coating composition because the thermal cure catalyst is initiated by heat released during the photoinitiated catalyst curing procedure. More particularly, the presence of a thermal cure catalyst may accelerate the cure of thickly coated sections, such as coating layers of between about 2 mm and about 50 mm.

As noted by the Examiner, Kovar '269 teaches coating compositions, which comprise a reaction product of a vinyl dioxolane and a polyester and a thermally initiated catalyst system composed of a mixture of cobalt, aluminum, and zinc and optionally a peroxide. Moreover Kovar '269 teaches that the coating compositions are **thermally cured** and that the catalyst systems are heat activated. Kovar '269 does not disclose or suggest curing the coating compositions disclosed therein with a radiation source. Nor does Kovar suggest the use of catalyst systems activated by irradiation to cure the coating composition. More particularly, the specification and claims of Kovar '269 make no reference whatsoever to photoinitiation as a suitable means of curing the disclosed coating composition.

The Examiner asserts that peroxides are known to "initiate in thermal and ionizing radiation." However, no support has been set forth to support the Examiner's assertion that peroxides are capable of photoinitiating the curing of the coating compositions presented in either the present invention or the Kovar '269 patent. Both Kovar '269 and the instant application discuss peroxides as thermal initiators but there is neither disclosure nor suggestion in either document of using peroxides as a photoinitiator, a distinct difference.

In formulating the §103(a) rejection, the Action states at page 4 that:

It would have been obvious for one of ordinary skill in the art at the time of the invention to add photoinitiators as taught by applicant to initiate polymerization in the presence of radiation to obtain a faster cure mechanism for the VOC free coating

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compositions as taught by Kovar et al with the expectation of adequate success in the absence of evidence to the contrary.

The prior art must provide some motivation to one of ordinary skill in the art to make the claimed invention in order to support a conclusion of obviousness. One criterion for a determination of obviousness that has been used again and again is whether the prior art would have suggested to one ordinary skill in the art that a particular process should be carried out or product made and would have had a reasonable likelihood of success viewed in light of the prior art.

In the present case, Kovar '269 simply does not suggest radiation curable coating compositions containing essentially no volatile organic components which comprise a photoinitiator for catalyzing the cure of the coating composition. Kovar '269 discloses a series of thermally curable coating compositions which comprise catalysts suitable for initiating the curing process. As discussed above, Kovar '269 neither discloses nor suggests the use of any radiation source as the energy source to commence the curing process. Nor does Kovar '269 suggest any advantages for using a radiation source for initiating the curing process.

Thus claims 1, 54 and 58 are patentable over Kovar '269 and claims 2-7, 20-39, 41-53, 56-57, and 59-73 which depend from claims 1, 54 and 58, are therefore also patentable over Kovar '269.

In view of the above discussion, it is respectfully submitted that the outstanding rejections and objections have been overcome and should be withdrawn. Early reconsideration and notice of allowance are earnestly solicited.

Should the Examiner wish to discuss the amendment made herein, the undersigned agent would appreciate the opportunity to do so. The Examiner is hereby authorized to call the

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undersigned, collect at the number shown below.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Kindly cancel claims 14 and 43 without prejudice or disclaimer.

Kindly amend claims 19 and 73, as follows:

19. (Amended) The radiation curable resin composition of claim 13, wherein the polyurethane acrylate comprises the reaction product of an acrylate and at least one hexamethylene diisocyanate (HMDI)-terminated polyethyleneadipate aliphatic urethane prepolymer.

73. (Amended) The radiation curable resin composition of claim 72, wherein the filler is an organic filler, inorganic filler or blends thereof[, comprising at least one of Ni coated carbon powder, iron powder, titanium dioxide, carbon black and thiokol blue].

Please add new claim 74, as follows:

74. (New) The radiation curable resin composition of claim 73, wherein the filler comprises at least one of a Ni coated carbon powder, an iron powder, titanium dioxide, carbon black or thiokol blue.